

What is claimed is:

1. An automatic tracking apparatus for a reflector comprising:
a surveying machine body;

5 an illumination portion disposed in said surveying
machine body for illuminating a measurement light toward a reflector;
a light receiving portion which is disposed in said surveying
machine body and which has an image sensor for receiving a reflection
light image of the measurement light illuminated toward said reflector;

10 arithmetic means for calculating a position of the reflection light
image from said reflector in an area of said image sensor; and

a rotation mechanism for rotating said surveying machine body
so as to position said reflector on a light receiving optical axis of said
light receiving portion based on the position obtained by said arithmetic
15 means,

wherein a light receiving area which is a smaller area than the
area of the image sensor area and has said light receiving optical axis as
a center is provided in the area of said image sensor.

20 2. The automatic tracking apparatus for the reflector according to
Claim 1, wherein the area of said light receiving area is changed in
accordance with a distance from said reflector to the surveying machine
body.

25 3. The automatic tracking apparatus for the reflector according to
Claim 1, wherein said light receiving area comprises a first light
receiving area and a second light receiving area which has a larger area

than the first light receiving area and surrounds the first light receiving area.

4. The automatic tracking apparatus for the reflector according to
5 Claim 3, wherein when a reflection light image of said reflector is not
existed in said first light receiving area, the reflection light image of said
reflector is detected in said second light receiving area, and when the
reflection light image of said reflector is not existed in said second light
receiving area, the reflection light image is detected in an area of the
10 image sensor.

5. The automatic tracking apparatus for the reflector according to
Claim 4, wherein a range of said second light receiving area is set within
a range in which said surveying machine body is rotated in horizontal
15 and vertical directions by said rotation mechanism within a scanning
time for one field of said image sensor.

6. The automatic tracking apparatus for the reflector according to
Claim 3, wherein said arithmetic means comprises a storing portion for
20 storing a position of said reflection light image and a position of a light
image other than said reflection light image, and when the light image
other than said reflection light image is existed in said second light
receiving area, said arithmetic means distinguishes between the
position of said reflection light image and the position of the light image
25 other than said reflection light image.

7. The automatic tracking apparatus for the reflector according to

Claim 6, wherein said storing portion stores a size and a shape of said reflection light image, and said arithmetic means specifies a reflector based on the size and the shape of said reflection light image as well as said position.